Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band	)	GN Docket No. 12-354

COMMENTS OF MOBILE FUTURE

Mobile Future submits these comments in response to the Commission's Notice of Proposed Rulemaking proposing to open the 3550-3650 MHz ("3.5 GHz") band for commercial broadband use on a shared basis.[1] The Commission's proposal holds promise as a vehicle to help address America's broadband spectrum crunch over the longer term. However, the Commission must proceed with caution to implement this innovative spectrum management proposal, but also should simplify its approach to ease implementation and allow commercial use of the 3.5 GHz band. Finally, while the Commission moves forward with solutions in this band, it also should continue to explore additional avenues to make spectrum available on an exclusive basis to commercial operators to better enable them to respond to ever-increasing consumer demand. Clearing and reallocating spectrum for exclusive licensed use by commercial operators continues to hold the most promise for the deployment of mobile broadband networks.

I. INTRODUCTION AND SUMMARY

Mobile Future is a coalition of wireless technology businesses and non-profit organizations dedicated to advocating for an environment in which innovations in wireless

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[1] *Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Notice of Proposed Rulemaking and Order, 27 FCC Rcd 15594 (2012) ("*3.5 GHz NPRM*").

technology and services are enabled and encouraged.[2] Mobile Future and its members have a substantial interest in the success of the Commission's efforts to solve the spectrum shortage facing mobile broadband service providers, for failure to do so will adversely impact the availability of wireless broadband services and, in turn, continued U.S. economic growth and development.[3] The mobile ecosystem is a key growth engine of the U.S. economy, transforming every aspect of consumers' lives and our nation's prosperity.[4] Mobile Future has been an active participant in Commission proceedings designed to introduce additional spectrum resources to the wireless marketplace[5] and to otherwise ensure that America's hundreds of millions of mobile broadband customers can continue to receive the services on which they increasingly rely.[6]

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[2] *See*, Mobile Future, About Us, http://www.mobilefuture.org/content/pages/aboutus/ (last visited Feb. 12, 2013).

[3] A study by Peter Rysavy, *The Spectrum Imperative: Mobile Broadband and its Impacts for U.S. Consumers and the Economy, An Engineering Analysis*, provides a comprehensive engineering analysis of the potential consequences for consumers and wireless innovation if no action is taken. Rysavy Research, LLC, *The Spectrum Imperative: Mobile Broadband Spectrum and its Impacts for U.S. Consumers and the Economy, An Engineering Analysis* (Mar. 16, 2011), *available at* http://www.rysavy.com/Articles/2011_03_Spectrum_Effects.pdf. The study outlines how spectrum affects network capacity, how applications and devices create heavy data traffic, and the resulting spectrum shortage once available capacity has been consumed.

[4] Wireless companies have invested roughly $94 billion in U.S. mobile networks over the past four years. *See* CTIA – The Wireless Association, Semi-Annual Wireless Survey (Oct. 2012), *preview available at* http://files.ctia.org/pdf/CTIA_Survey_MY_2012_Graphics-_final.pdf. Achieving the President's goal of making an additional 500 MHz of spectrum available by 2020 could create 500,000 American jobs and contribute $400 billion to the nation's gross domestic product. *See* David W. Sosa and Marc Van Audenrode, Analysis Group, *Private Sector Investment and Employment Impacts of Reassigning Spectrum to Mobile Broadband in the United States* (Aug. 2011), *available at* http://www.mobilefuture.org/page/-/spectrum-impact-study.pdf. The wireless industry is responsible in the U.S. for 3.8 million jobs, generated $195.5 billion in economic activity globally in 2011, and accounted for $33 billion in productivity improvements in 2011 alone. Roger Entner, Recon Analytics LLC, *The Wireless Industry: The Essential Engine of US Economic Growth*, at 1, 4 (May 2012), *available at* http://reconanalytics.com/wp-content/uploads/2012/04/Wireless-The-Ubiquitous-Engine-by-Recon-Analytics-1.pdf.

[5] *See, e.g.*, Comments of Mobile Future, GN Docket No. 12-268 (dated Jan. 25, 2013); Letter from Jonathan Spalter, Chairman, Mobile Future, to Marlene H. Dortch, Secretary, Federal Communications

The *3.5 GHz NPRM* correctly acknowledged "the shortage of available spectrum for commercial broadband uses in this country and the urgent need to make additional spectrum available . . . ."[7] In fact, U.S. wireless networks are the most congested in the world operating at 80% of capacity, compared to a global average of just 65%.[8] This spectrum overload, if not remedied, will manifest itself in increased frequency of dropped calls, longer connection wait-times, missed economic opportunity, slower innovation, and sluggish job growth for American communities.[9]

The Commission's proposal to make spectrum in the 3.5 GHz band available on a shared basis may be a viable tool for carriers to offload traffic from spectrum below 3 GHz that is best suited for mobile broadband services.[10] However, the Commission's proposal will require substantial research, development and testing to implement, and should therefore be viewed as a potential longer-term solution to the spectrum crunch. The Commission should proceed cautiously in implementing this innovative approach, to ensure that spectrum in the 3.5 GHz

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Commission, WC Docket No. 10-90 (dated June 14, 2012); Letter from Jonathan Spalter, Chairman, Mobile Future, to Marlene H. Dortch, Secretary, Federal Communications Commission, ET Docket No. 10-235 (dated Apr. 4, 2012).

[6] *See, e.g.*, Reply Comments of Mobile Future, WT Docket No. 12-269 (dated Jan. 7, 2013); Comments of Mobile Future, WT Docket No. 12-269 (dated Nov. 28, 2012).

[7] *3.5 GHz NPRM*, 27 FCC Rcd at 15599 ¶ 14.

[8] Phil Goldstein, *Credit Suisse report: U.S. wireless networks running at 80% of total capacity*, FierceWireless (July 18, 2011), http://www.fiercewireless.com/story/credit-suisse-report-us-wireless-networks-running-80-total-capacity/2011-07-18.

[9] Jonathan Spalter, *Reallocating spectrum for economic growth*, Politico (Dec. 11, 2012), *available at* http://www.politico.com/story/2012/12/reallocating-spectrum-for-economic-growth-84838.html.

[10] As acknowledged by the *3.5 GHz NPRM*, "the 3 GHz threshold often [is] identified as the cutoff for ideal spectrum for mobile cellular uses." *See 3.5 GHz NPRM*, 27 FCC Rcd at 15601 ¶ 19 (citation omitted).

band is made available on an economic and operationally viable basis. If the Commission decides to pursue this approach for the 3.5 GHz band, it should simplify its plan to make it more broadly available on a licensed basis. Finally, the solution advanced in this proceeding should be viewed as just one of many potential tools to address the spectrum crunch. In light of the time required to implement the proposed dynamic shared access model, and the ever-growing consumer demand for mobile services that places increasing demands on limited spectrum resources, the Commission must simultaneously pursue other solutions to make spectrum available on an exclusive basis. The Commission should place a primary emphasis on making spectrum available for exclusive commercial use to promote mobile broadband deployment.

II. THE DYNAMIC SHARED ACCESS APPROACH PROPOSED FOR THE 3.5 GHz BAND HOLDS PROMISE AS A POTENTIAL LONGER-TERM SOLUTION TO THE SPECTRUM CRUNCH IF IT IS MADE MORE BROADLY AVAILABLE

The Commission's proposal for the 3.5 GHz band holds promise as a vehicle to help address the nation's spectrum shortage if it is modified to be more broadly available for traffic offload. Notwithstanding its promise, it must be viewed as a longer-term initiative. As the Commission acknowledges, substantial research, development and testing are necessary before its 3.5 GHz proposals can be implemented. The implementation of new, untested technology-driven approaches to sharing with federal users requires the exercise of caution. The tiered shared access model proposed in the *3.5 GHz NPRM* is predicated on the deployment of a Spectrum Access System ("SAS") "incorporating a dynamic database and, potentially, other interference mitigation techniques."[11] Yet, the Commission recognizes that the SAS "as applied

[11] *Id.* at 15597 ¶ 7. *See also id* at 15612 ¶ 50.

to the 3.5 GHz Band would implicate some novel issues," including the need for "a new generation of this dynamic database technology" that "would require significant planning and testing."[12]

The technical challenges associated with developing and deploying a technology-driven system for sharing spectrum are substantial. A recent analysis of the issue by Peter Rysavy, *Spectrum Sharing: The Promise and The Reality*, concludes that "[t]he spectrum sharing implementation timeline is going to be long and involved" because it "will entail a multi-faceted process that requires identifying what types of systems will be shared and how, determining the market for shared systems, developing specifications and standards to allow sharing including spectrum coordination systems, modifying primary and secondary systems to integrate with the new sharing architectures, and developing infrastructure and devices to implement the sharing."[13] Sharing will require a "means of certifying that new equipment is in compliance with the access rights that have been defined . . . new test equipment, new test procedures, and new certification bodies" as well as monitoring "to ensure that deployed systems are in compliance, and when they are not, enforcement procedures will be needed to remedy the problems."[14] These challenges will require substantial time and Commission resources and are a condition precedent to any realistic discussion of the role of SAS in relieving the spectrum crunch.

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[12] *Id.* at 15614 ¶ 58. *See also id*. at 15626 ¶ 95 ("We recognize, however, that the SAS we propose would be a new iteration of database technology used to manage spectrum resources, and that its creation would require significant planning and testing.").

[13] Rysavy Research, LLC, *Spectrum Sharing: The Promise and The Reality*, at 11 (July 2012), *available at* http://www.rysavy.com/Articles/2012_07_Spectrum_Sharing.pdf.

[14] *Id.* at 10.

If the Commission decides to pursue a dynamic shared access model in the 3.5 GHz band, it should simplify its proposed access tiered approach to facilitate use of the band by commercial providers for broadband offload. As described in the *3.5 GHz NPRM*, a "Priority Access" tier would make available one-half of the spectrum in the 3.5 GHz band to "eligible users" with "mission critical" quality-of-service needs. "Priority Access" users would register their facilities in the proposed SAS, and would be entitled to interference protection from General Authorized Access ("GAA") users, such as mobile broadband providers. However, creation of the Priority Access tier, as currently proposed, would undercut the Commission's efforts to employ the 3.5 GHz band to address broadband spectrum capacity issues. If the Priority Access tier is limited to operations solely by a discrete category of user, it could effectively preclude use of one-half of the 3.5 GHz band for offloading commercial mobile broadband traffic.[15] Under the proposal, "mission critical" facilities (a term that is only vaguely defined) would have priority over mobile broadband facilities, would be entitled to interference protection from mobile broadband facilities, and could force even previously-deployed mobile broadband facilities to accept interference.[16] As a result, establishment of a priority access tier threatens to compromise the viability of half of the 3.5 GHz band for mobile broadband by making its long-term availability highly speculative.

Limiting the Priority Access tier to certain classes of service providers is also contrary to the Commission's general trend towards flexible use, is administratively complex, and would

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[15] *3.5 GHz NPRM* at 15618-20 ¶¶ 70-74.

[16] *See id*.

undercut one of the primary purposes of the band, commercial offload. Regardless of the details of the regime to be adopted, commercial service providers must be permitted to secure licenses to provide services in specified locations to offload traffic on a non-interfering basis to users in the Incumbent Access tier. This would promote use of the band by commercial operators with significant need for additional capacity because it would minimize the speculative nature of their access to the band. This approach also would be more consistent with the Commission's flexible use policies, which foster spectrum use through limiting unnecessary regulatory barriers to access and use.[17]

III. IT IS CRITICAL THAT THE COMMISSION CONTINUE TO EXPLORE OTHER SOLUTIONS TO MAKE SPECTRUM AVAILABLE ON AN EXCLUSIVE BASIS TO ALLEVIATE THE SPECTRUM CRUNCH

While the *3.5 GHz NPRM* is a step forward in exploring new technological answers to sharing, the Commission must continue to pursue aggressively other – more proven – solutions to the spectrum crunch. As this spectrum is encumbered by incumbent federal users and fixed satellite service operators,[18] exclusion zones will be necessary to protect incumbents. Even if the

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[17] *Service Rules for the 698-746, 747-762 and 777-792 MHz Bands, Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, Section 68.4(a) of the Commission's Rules Governing Hearing Aid-Compatible Telephones, Biennial Regulatory Review - Amendment of Parts 1, 22, 24, 27, and 90 to Streamline and Harmonize Various Rules Affecting Wireless Radio Services, Former Nextel Communications, Inc. Upper 700 MHz Guard Band Licenses and Revisions to Part 27 of the Commission's Rules, Implementing a Nationwide, Broadband, Interoperable Public Safety Network in The 700 MHz Band, Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements through the Year 2010, Declaratory Ruling on Reporting Requirement under Commission's Part 1 Anti-Collusion Rule,* Second Report and Order, 22 FCC Rcd 15289, 15378 ¶ 242 (2007).

[18] It has been asserted that economic constraints make relocation of federal incumbents to alternative spectrum impractical at the present time. *See* NTIA, U.S. Department of Commerce, *An Assessment of the Near-Term Viability of Accommodating Wireless Broadband Systems in the 1675-1710 MHz, 1755-1780 MHz, 3500-3650 MHz, and, 4200-4220 MHz, 4380-4400 MHz Bands* (Oct. 2010) ("Fast Track

Commission elects to implement an approach to sharing the 3.5 GHz band that permits smaller commercial exclusion zones than those anticipated by the National Telecommunications and Information Administration's ("NTIA") Fast Track Report, those zones may still be large. The *3.5 GHz NPRM* anticipates that the zones will still cover a significant portion of the United States population along the coasts, and commercial users will not necessarily be protected from interference by incumbent radar operations outside the exclusion zones.[19] As a result, the benefits of moving traffic off prime mobile spectrum to the 3.5 GHz band envisioned by the Commission simply cannot be fully realized in those areas where sharing is necessary, which unfortunately are often heavily populated areas where the spectrum shortage is most acute.

In sum, the 3.5 GHz band is hardly the "silver bullet" solution to the spectrum crunch. If appropriately governed, the 3.5 GHz band may prove over the long term to be a part of the solution. But, at best, the 3.5 GHz band will only be a small part of a much more complex approach that includes the reallocation of spectrum below 3 GHz over the short- and intermediate-terms for exclusive commercial use. Only by providing mobile broadband operators with this exclusive access to the spectrum resources they need can the Commission promote an ecosystem that meets consumer demand, spurs innovation and job creation, and assists America in retaining its leadership role in the global mobile economy. It therefore is essential that the Commission continue to move forward with all deliberate speed in its ongoing

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Report"), *available at* http://www.ntia.doc.gov/files/ntia/publications/fasttrackevaluation_11152010.pdf; *3.5 GHz NPRM*, 27 FCC Rcd at 15602-03 ¶¶ 22-25.

[19] *3.5 GHz NPRM*, 27 FCC Rcd at 15614 ¶ 59 (proposing to allow commercial use "in areas where small cell devices would not cause harmful interference to incumbent operations but where signals from incumbent operations could possibly interfere with GAA uses on occasion." (citation omitted)).

efforts to implement 600 MHz band incentive auctions, 2 GHz Advanced Wireless Service auctions and other initiatives that are designed to add more spectrum below 3 GHz for commercial mobile broadband services, including, in particular, coordination with NTIA to clear Federal operations from the 1755-1850 MHz band and make that critical spectrum available for commercial use.

IV. CONCLUSION

The Commission should proceed carefully, and allow the necessary research, development and testing to occur to determine whether dynamic shared access to spectrum in the 3.5 GHz band will provide a viable means of bringing this spectrum into commercial use. If the promise of this approach is confirmed, the FCC should modify its proposed "Priority Access" tier to promote access to and use of the band in response to consumer demand. Finally, and of utmost importance, the Commission must simultaneously pursue other means to reallocate and make spectrum available on an exclusive basis for the provision of mobile services.

Respectfully submitted,

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